MISSOURI RIVER

Master Water Control Manual Review and Update Study

FACT SHEET

Groundwater Impacts

This Fact Sheet provides a brief overview of a specific topic important to the Master Water Control Manual Review and Update Study process. Information contained in this Fact Sheet is summarized from technical reports and the preliminary Revised Draft Environmental Impact Statement.

Summary

There are 1.2 million acres of productive cropland along the Lower River, downstream from Gavins Point Dam, that potentially could be affected by high groundwater. To address the concerns of farmers along the Lower River on the effects of increasing flows to benefit fish and wildlife, the Corps conducted groundwater analyses. Impacts to groundwater for each alternative were determined by calculating the crop damage reduction (beneficial impact) or crop damage increase (negative impact) compared to the CWCP for four representative sites.

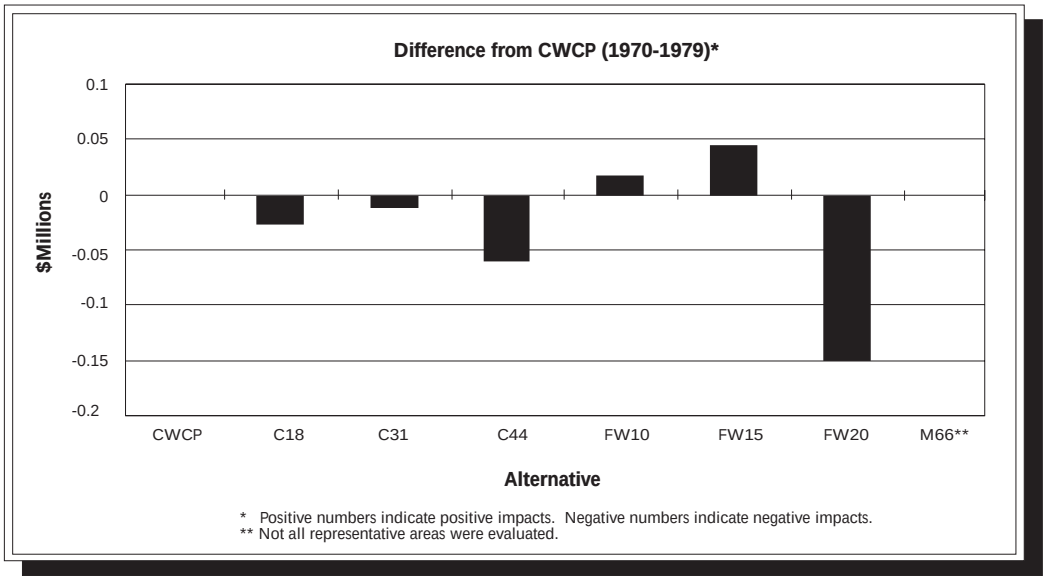
Average annual impacts range between a reduction in crop damages of $50 thousand (FW15) to an increase in crop damages of $150 thousand (FW20) from $2.85 million under the CWCP. River flows during mid-summer vary by alternative and correlate to the differences in groundwater impacts between the alternatives.

Existing Conditions

The Missouri River floodplain contains about 1.2 million acres of productive agricultural land along the Lower River. In addition to Missouri River flooding, high groundwater reduces the productivity of this land. In response to public comments on the draft environmental impact statement (DEIS) regarding the lack of groundwater information, the Corps conducted groundwater studies at four representative sites downstream of Gavins Point Dam from Onawa, Iowa to Hermann, Missouri: RM691, an unleveed site around Onawa, Iowa; levee unit L575, around Hamburg, Iowa; levee unit L488/497, north of St. Joseph, Missouri; and the Tri-County levee unit across the river from Hermann, Missouri.

The impact on the groundwater from changing river levels is unique in each of the four sites for two reasons. First, there is a

Figure 1: Differences in average annual groundwater impacts



difference in the relative size of the affected areas (RM 691 and levee unit L575 are much larger than levee unit L488/497 and the Tri-County levee unit). Second, there is a difference in the topography of the farmable land relative to the water level in the river. These differences mean that, although it is possible to calculate the total amount of potential damage for each alternative, the damage is not evenly spread among the sites, and it is not evenly distributed across each site. Under current conditions and under each alternative, damages are likely to be reduced or improved in concentrated areas of farmable land based on many physical features.

Groundwater studies for the four representative sites involved creating and analyzing models using actual groundwater data. The output from the groundwater model simulation runs were in terms of percent of the modeled area that had depth to groundwater levels at 1-foot increments from zero to 9 feet deep.

Economic impacts to groundwater were calculated for each of the eight representative alternatives for the four representative sites by translating the results of the groundwater studies (expressed in terms of depth of groundwater) into millions of dollars per year of crop damage.

Comparison of the Alternatives

Impacts under each of the alternatives are compared by determining the crop damage reduction (beneficial impact) or crop damage increase (negative impact) from the CWCP. Total average annual crop damage under the CWCP is $2.85 million. The St. Louis target alternative (M66) was not included in the analysis for all four representative sites, but impacts would be similar to those for alternative C18. The groundwater study analysis was conducted for water years 1970 to 1979 (a 10-year period) using current-day economic values. Crop distribution was considered to be equally divided between corn and soybeans.

Figure 1 presents the differences in potential damages from the CWCP in millions of dollars per year that would result with the implementation of each alternative. Impacts range from a $150 thousand increase in damages (negative impact) for alternative FW20 to a $50 thousand reduction in damages (beneficial impact) for alternative FW15. The variation between these impacts is attributed to the lower river stages in mid-summer under alternatives FW10 and FW15 (where flood evacuation is not allowed) that do not occur under alternative FW20 (which allows flood evacuation). Alternatives FW10 and FW15 decrease groundwater damages when compared to the CWCP.

Site-by-Site Comparison

Figure 2 presents the average annual groundwater damages for the eight alternatives for each of the four representative sites. As discussed earlier, the reaction of the groundwater to river level changes is variable at each of the four sites. Correspondingly, the groundwater damages are highly variable among the four sites. Under the CWCP, levee unit RM691 has the lowest average annual damages per acre at $2.60. Levee unit L575 is second with a significant increase to $16.41 per acre. Average damages per acre double again for the Tri-County levee unit, which has average annual damages per acre of $29.57. Finally, levee unit L488/497 site has the highest average annual damages per acre of $48.47. These damages are averaged over the total area modeled, though they are more likely to be concentrated in only a portion of a total site. It is, therefore, likely that some farmers would experience significantly higher groundwater damages per acre than these numbers represent, and some would experience significantly lower damages.

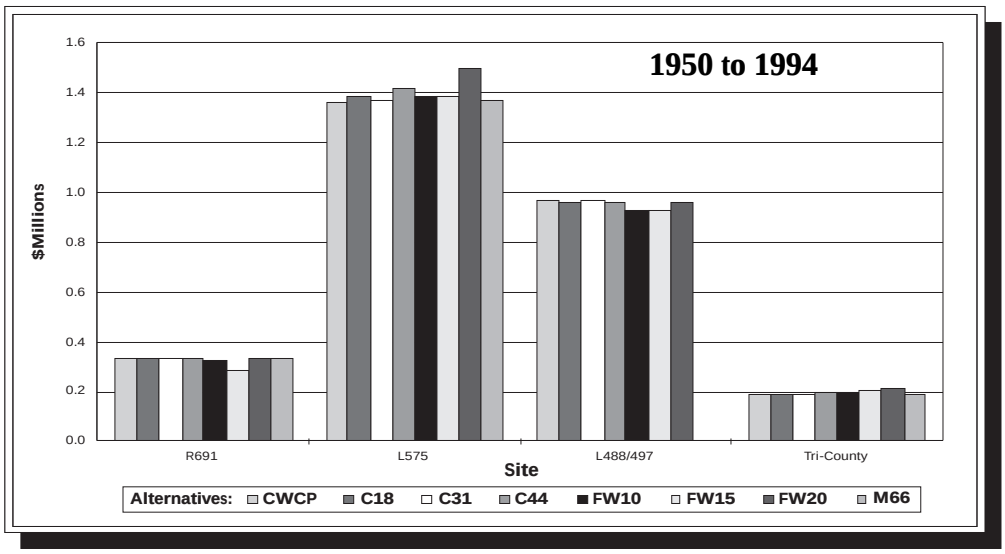


Figure 2: Average annual groundwater damages for the four representative sites